The Wireless Connectivity Expert

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ACT-IR100SL and ACT-IR100SL-M

User's Manual

(IrDA Intelligent RS232 Adapters)

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May 27, 2002 Ver. 1.20

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FCC & VCCI Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1)This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
WARNING-FCC Regulations state that any unauthorized changes or modifications to this equipment not expressly approved by the manufacturer could void the user authority to operate this equipment

NOTE: This equipment has been tested and found to comply with the limits for Class B digital device, pursuant to Part 15 of the FCC Rules. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will nor occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Increase the separation between the equipment and receiver.
-Reorient or relocate the receiving antenna.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

This equipment is in the 2nd Class category (information equipment to be used in a residential area there to) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.
When used near a radio or TV receiver, it may become the cause of radio interference. Read the instructions for correct handling.

NOTE: Must be used with shielded cable only.

FOR YOU RECORDS.....
For your assistance in reporting this product in case of loss or theft, please record below the model number and serial which are located on the bottom of the case. Please retain this information.

Model Number	Serial Number
Date of Purchase	Place of Purchase

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PRECAUTIONS

To ensure trouble-free operation, please observe the following precautions:

Optical communications are easily affected by external light sources, weak batteries, transfer distance, transfer angle, etc.

Any of these conditions may cause a data transfer failure, incomplete, missing or incorrect data.

Make sure that the wireless interface is away from direct sunlight and other strong light source.

- Do not terminate arbitrarily during file transfer process between DUT and computers until finished.
  Otherwise DUT internal data integrity may be damaged, which is due to the violation of DUT's.
- Do not expose the unit to moisture, as this will damage the internal circuitry.
- Do not expose the unit to extreme temperatures. It should not be placed in direct sunlight or in a closed vehicle, neither should it be placed near heaters nor other heat sources.
- Do not store the unit in a humid or dusty place.
- Use a soft, dry cloth to clean the unit. Do not use a wet cloth or any solvent.
- Do not drop the unit or handle the unit carelessly.

CAUTION:

- Never touch the pins of computer connection terminal. The internal circuits can be damaged by a static electricity discharge. If this device requires any servicing, use only an ACTiSYS service dealer, an ACTiSYS approved service facility, or an ACTiSYS repair service.
- When exchanging data with host computer, be sure the appropriate serial communication port is available and is not in conflict with other peripheral device or software.

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1. Features

Support IrDA standard including:

- IrLAP
- IrLMP
- TinyTP
- IrCOMM
- IrOBEX transport

Other standards:

- IrLPT

IrDA baud rate supported:

- 9.6kbps
- 19.2kbps
- 38.4kbps
- 57.6kbps
- 115.2kbps

IrDA Primary/Secondary Mode supported:

- IR100SL : Secondary Mode only
- IR100SL-M : Both Primary and Secondary Mode supported, and mode automatically switched upon IrDA protocol negotiation with the other device

Host Interface:

- Full-duplex asynchronous serial (TXD, RXD)
  (Or simplex TXD only and software flow control with RXD.)
- Hardware flow control (RTS, CTS)
- Optional line status for link control (DTR, DSR)
- Other optional inputs (RI, CD)
- Designed for use in RS232C level and that it is in DTE (Data Terminal Equipment) configuration.

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Host interface baud rate supported:

- 1.2kbps
- 2.4kbps
- 4.8kbps
- 9.6kbps
- 19.2kbps
- 38.4kbps
- 57.6kbps
- 115.2kbps

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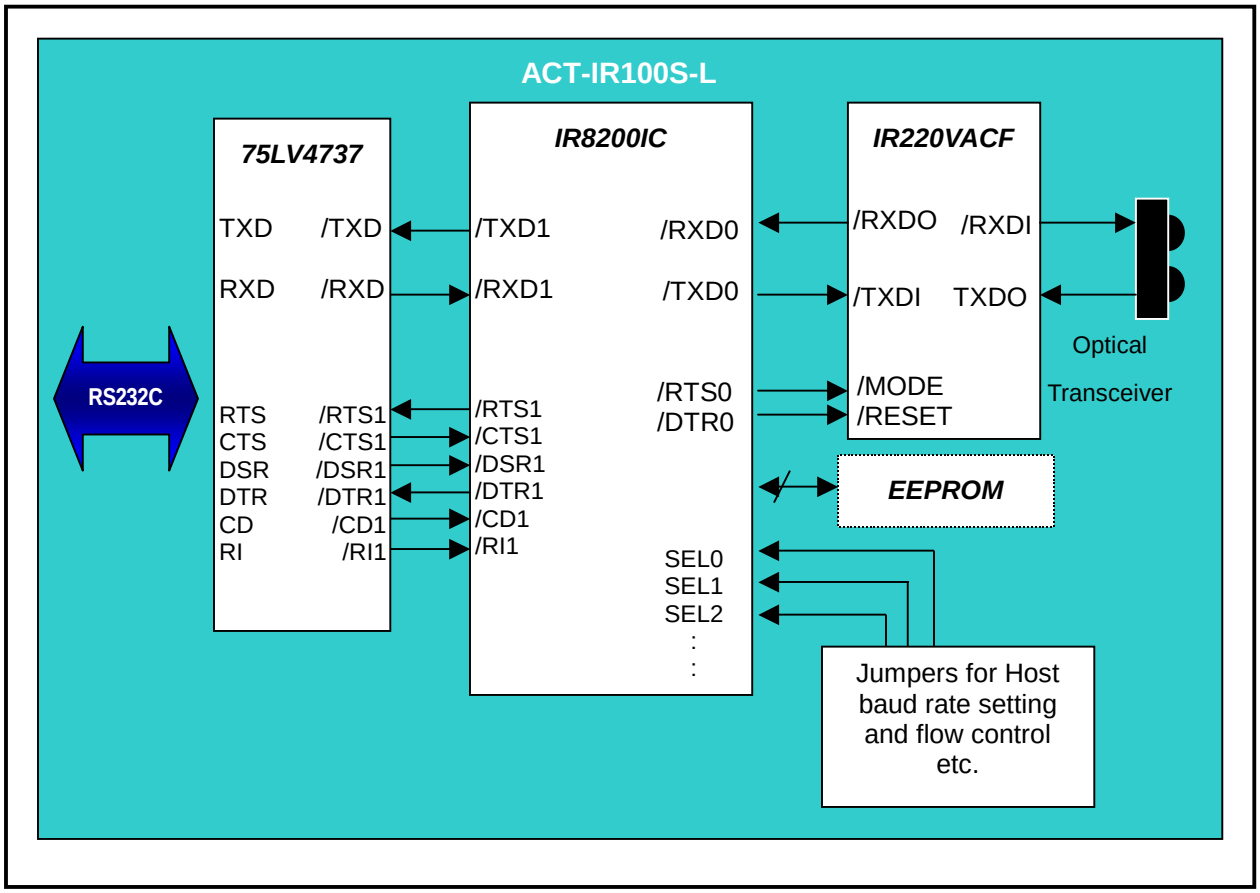
2. Overview

The ACT-IR100S-L/LM is a IrDA-Ready intelligent adapter. This enables the host system with IrDA communication capabilities. The host system may be a serial printer, a modem, an industrial controller, a data collector, a medical instrument, or any other device, that may benefit from being IrDA enabled.

The interface between ACT-IR100S-L/LM and the host is via a traditional asynchronous serial data port (RS232C). Figure 2.1 shows the system block diagram.

Figure 2.1 System Block Diagram



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3. Applications

3.1 Embedded IrDA protocol stack

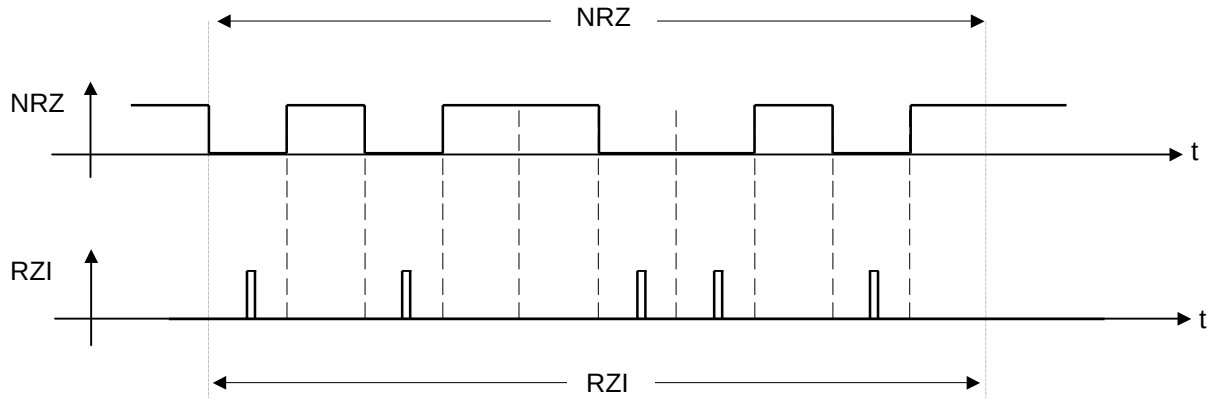
The mandatory IrDA protocol layers, IrLAP (comply with TEST frame capability requirement) and IrLMP (including IAS) are handled by ACT-IR100S-L/LM, In addition, TinyTP, IrCOMM, IrLPT, IrOBEX transport are all included.

The incoming/outgoing IrDA user data payload are buffered and then transferred to/from the host. The baud rates of IrDA traffic and host interface are independent of each other. The flow controls of IrDA traffic and host interface are also independent of each other.

3.2 SIR IrPHY encoder-decoder

The ACT-IR220VACF chip use in this adapter is an IrPHY encoder-decoder. It translates UART or RS232 NRZ signals to/from IrPHY SIR code (RZI modulation).

The ACT-IR220VACF is a half-duplex infrared communication processor for exchanging data from IR and RS232, ACT-IR220VACF cover data baud rate between 9.6kbps and 115.2kbps.
The IrPHY specification allows two kinds of modulations: 3/16 of a bit duration pulse, or minimum pulse duration of 1.63 us, we use minimum pulse duration of 1.63 us to modulation bit data.



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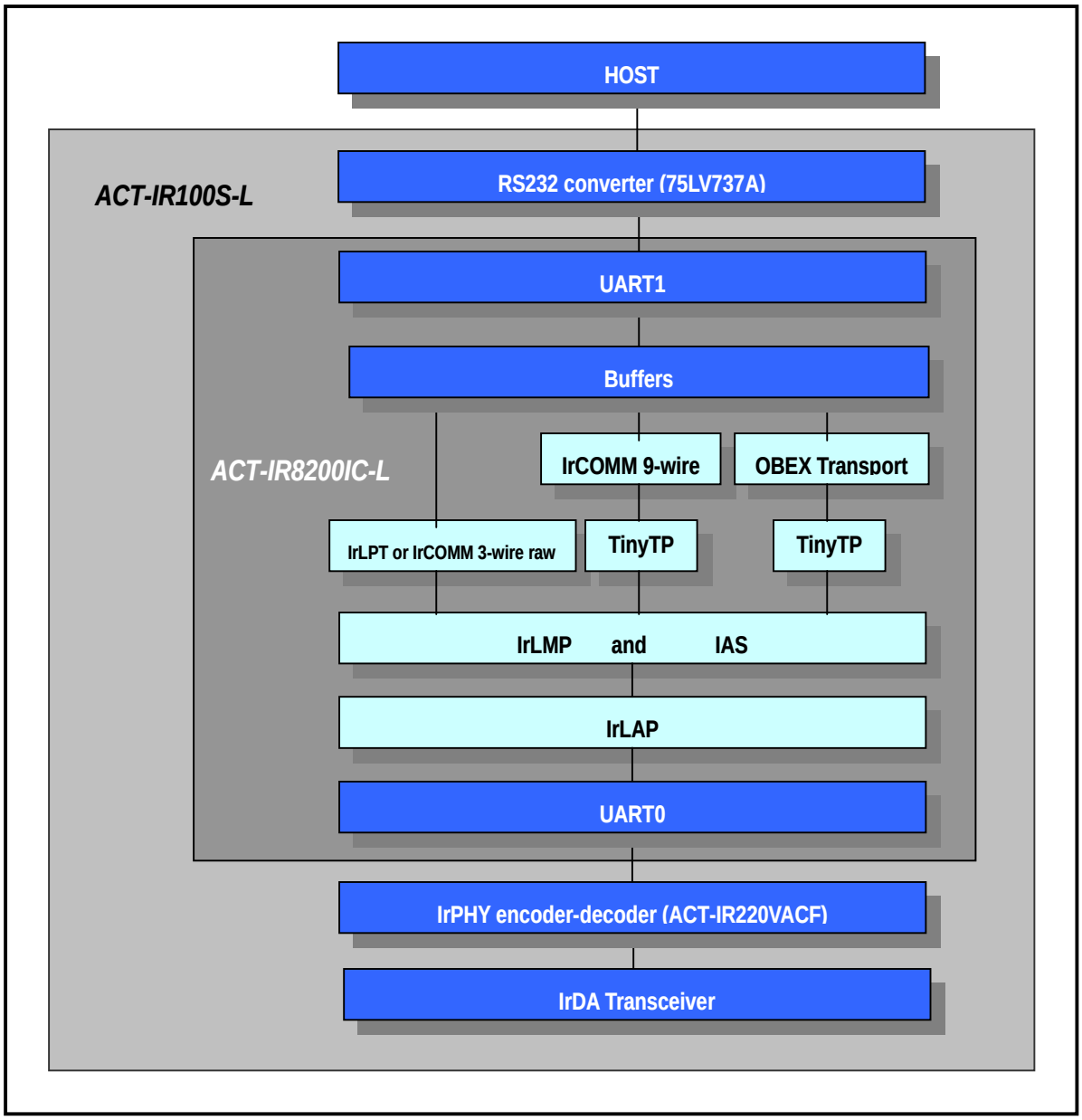

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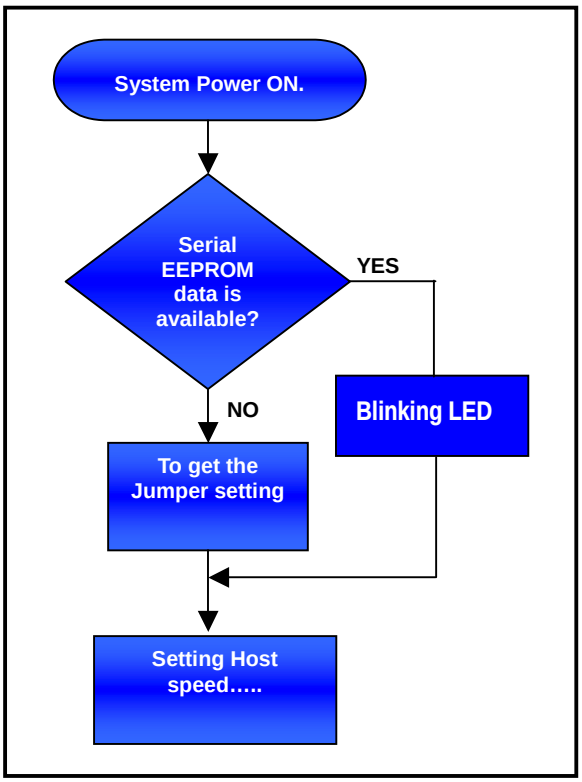
4. Operation Setting, EEPROM, and other optional hardware

4.1 Serial EEPROM

There are some special functions if the external serial EEPROM installed.

The optional serial EEPROM allow users to set "Host Speed" and "Hardware Flow Control and Connection Control". The system initial sequence are shown below:



Note: The serial EEPROM setting can override jumper settings.

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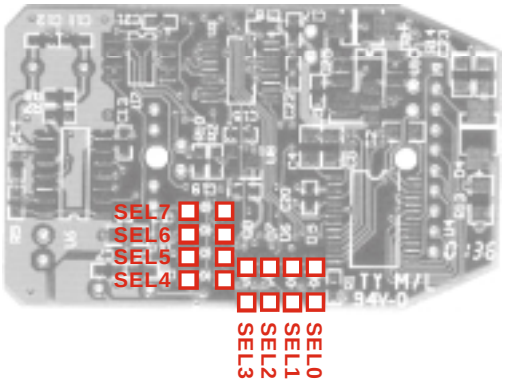
4.2 Baud Rate Setting

Jumpers SEL0-2 and serial EPROM settings are used to set the host interface RXD and TXD data rate. Note that this is independent of the IrDA connection data rate.
Data format is always 8 data bits, no parity, and 1 stop bit. Note that this is compatible with end-to-end data format using 7 data bits, parity, and 1 stop bit. That is, the application at both end of the IrDA link may generate and check parity if 7 data bit is used.
The Host Interface can operate on eight different baud rates from 1.2kbps to 115.2kbps.

PCB bottom view



SEL7 ~ SEL0 (D12 ~ D5):

1: None

0: Install DIODE (1N4148)

Baud Rate	Jumpers		
	SEL2	SEL1	SEL0
1.2kbps	0	0	0
2.4kbps	0	0	1
4.8kbps	0	1	0
9.6kbps	0	1	1
19.2kbps	1	0	0
38.4kbps	1	0	1
57.6kbps	1	1	0
115.2kbps	1	1	1

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4.3 Ignore DSR

SEL3 open(SEL3=1) means ignore the physical DSR input, pretend that DSR is on.
This logical DSR is always used for connection control.
The physical DTR is used for connection indication. SEL3 has no effect on DTR.

When SEL3 close(SEL3=0), DSR is used for connection control. Active DSR permits IrDA connection. Inactive DSR forbids new connection and terminates existing connection.

Ignore DSR	Jumper SEL3	Descriptions
NO	0	DSR is used for IR connection control.
YES	1	Ignore DSR input.

4.4 Ignore CTS

SEL4 open(SEL4=1) means ignore the Physical CTS input, pretend that CTS is on.
This logical CTS is always used for TXD flow-control.
The physical RTS is used for RXD flow-control. SEL4 has no effect on RTS.

When SEL4 close(SEL4=0), CTS is used for flow control of TXD. Active CTS permits TXD. Inactive CTS forbids TXD.

Ignore CTS	Jumper SEL4	Descriptions
NO	0	CTS is used for RxD flow control.
YES	1	Ignore CTS input.

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4.5 EEPROM Function Disable

Jumper SEL7 is use to enable or disable EEPROM function.

If this function disable, IR100S-L/LM will use SEL0~SEL4 setting only.
If this function enable, IR100S-L/LM will use EEPROM setting and jumpers SEL0~SEL4 are ignored.

Function	Jumper SEL7	Descriptions
Disable	0	Disable EEPROM function
Enable	1	Enable EEPROM function

Note:

1. SEL5 ~ SEL6 are reserved for future use.
2. Independent of the SEL3 or SEL4, software flow control is automatically used and DTR always active during IrLPT connection (this is used for printer host). In this case, if RXD received an X-OFF, TXD transmission is blocked. If RXD received an X-ON, TXD transmission may resume. In addition, hardware flow control may also be enabled.
3. For IrLPT, XON/XOFF flow control is always enabled. This is independent of SEL3 or SEL4.
4. In IrCOMM 9-wire connection IR100S-L always response DCE line status if line state is changed or response Poll for Line Settings via IrLMP control channel.
   Independent of the IR flow control, HOST data flow control and baudrate is not obey IrCOMM control parameters.

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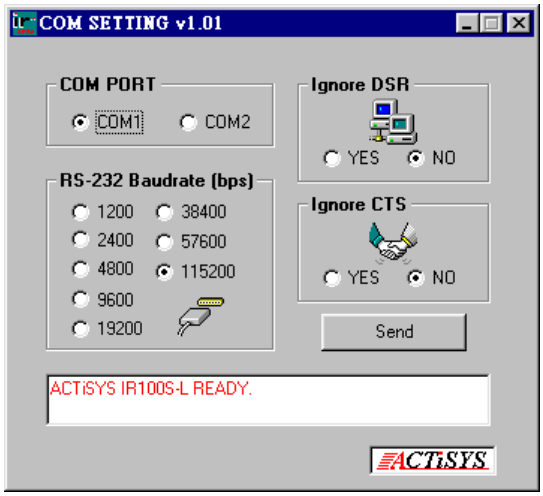
4.6 On Line Change Host Speed and Hardware Flow Control/Connection Control

The ACT-IR100S-L/LM allowed user to change Host Speed or Hardware Flow Control/Connection Control in run time.

IRSET can change setting and write new value into the EEPROM via IR.

COMSET can change setting and write new value into the EEPROM via COM port.



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4.7 RS-232C DTE DB-9P Connector

Pin No.	Name	Descriptions	I/O
1	CD	Data Carrier Detect	I
2	RXD	Receiver Data	I
3	TXD	Transmitter Data	O
4	DTR	Data Terminal Ready	O
5	GND	Signal Ground	GND
6	DSR	Data Set Ready	I
7	RTS	Request to Send	O
8	CTS	Clear to Send	I
9	RI	Ring Indicator	I

Front View

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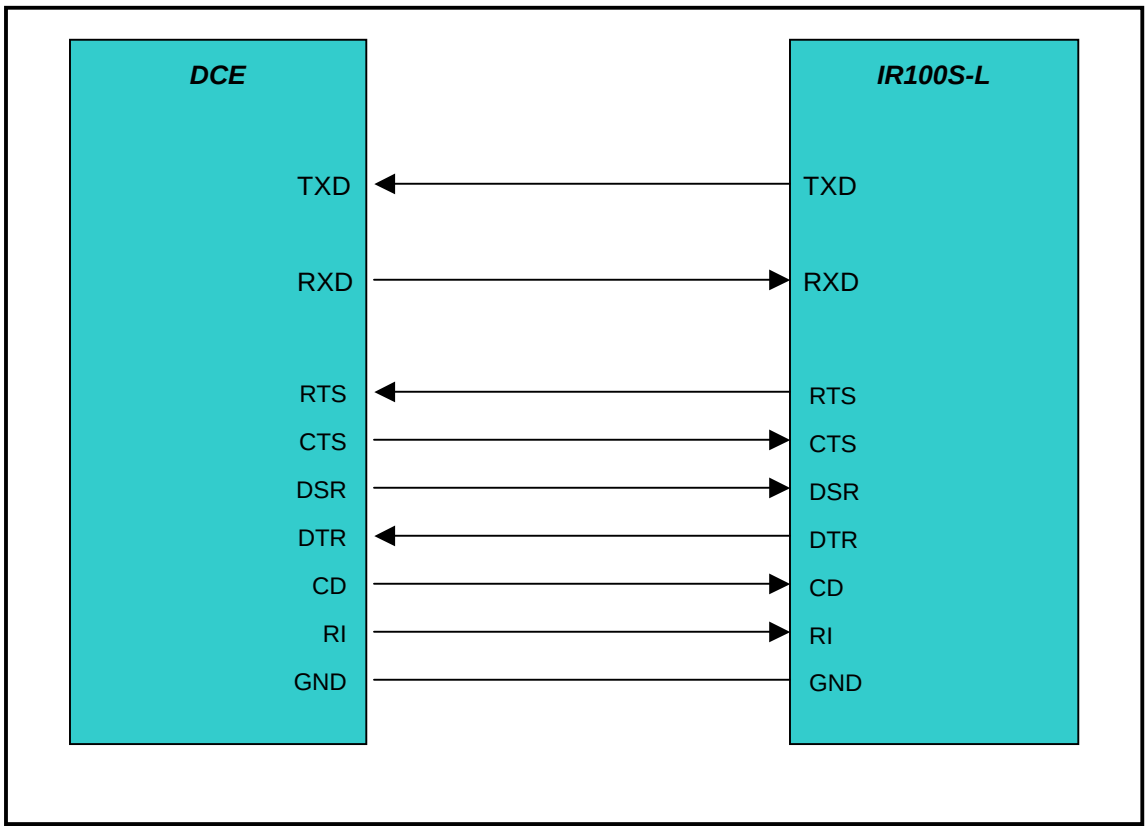
5. How to Connect IR100S-L/LM with host Device

IR100S-L/LM uses a standard RS232 DTE port to connect with the host. If the host device is a Modem like device and has a RS232 DCE port, then use a "straight cable". That is, connect the signals with the same name from one side to the other.



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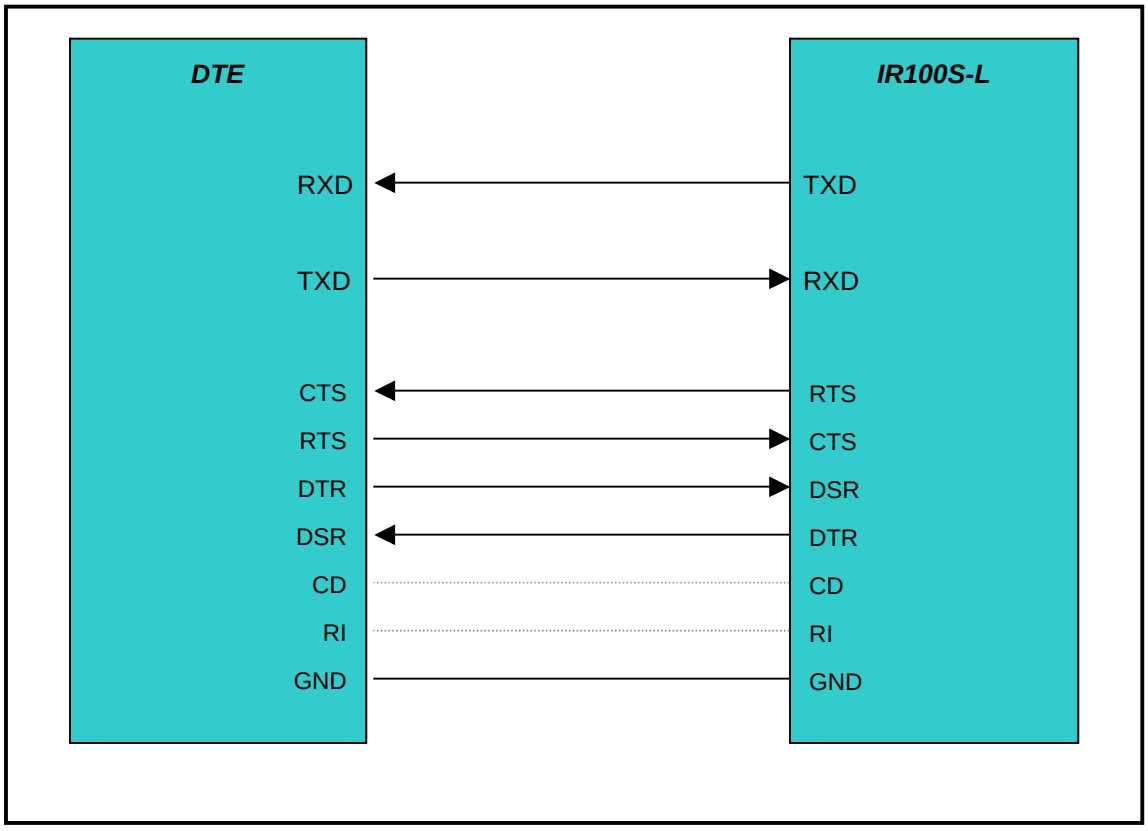
If the host device is a PC like device and has a RS232 DTE port too, then you need to use a "Null Modem" connection between the two. That is, in/out signal pairs need to be crossed.



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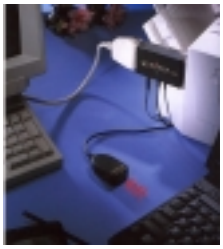
OTHER ACTiSYS IrDA PRODUCTS

I (ACT-1): IrDA Primary Station Protocol Stack

- IrLAP, IrLMP, IAS and optional Tiny TP, IrCOMM, IrMC, IrTran-P, etc..
- For PDA, digital camera, handheld data terminal, palmtop computer, smart phone.
- Very tight code, modular design, easy porting and API interface, well supported.
- Small code size (20 - 40K bytes), well tested and inter-operate with all IrDA devices.

II (ACT-2): IrDA Secondary Station Protocol Stack

- IrLAP, IrLMP, IAS and optional Tiny TP, IrCOMM, IrMC, IrTran-P, etc.
- For printer, pager, docking station, medical device, cell phone, storage devices.
- Very tight code, modular design, easy porting and API interface, well supported.
- Small code size (4 - 20K bytes), well tested and inter-operate with all IrDA devices.



100M: IrDA Printer Adapter

- Attached to and works well with any parallel printers.
- IR wireless printing directly from your IrDA devices.
- Automatic switch between mobile IR and desktop cable-based printing.
- LED indicate transmission speed and printing status.

220L/L+: IrDA Com-Port Serial Adapter

- Connects to the serial port on any computer. No power eeded!
- Data transfer wirelessly from IrDA mobile devices.
- Model already built into Windows 95, 98, 2000 IR driver.
- IR distance from 0cm-200cm with no external power!

2000U: FIR-USB Adapter

- Plugs into any desktop PC USB port.
- Gives you the full IrDA speeds from 9.6K to 4M bps.
- Meets both USB 1.1 and IrDA 1.1 specification.
- Bundled with drivers for Windows 98 and Windows 2000.
- USB bus-powered, requires no external power supply.

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THE FOLLOWING WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

LIMITED WARRANTY

ACTiSYS Corporation warrants to the first consumer purchaser, for a period of 1 year from the date of purchase, that this wireless interface (The Product? Will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof at no charge to the purchaser for parts or for labor.

This warranty does not apply to any appearance items of the Product, any consumable items such as paper, ink ribbon, or batteries supplied with the Product, or to any equipment or any hardware, software, firmware, or peripheral other than the Product. This warranty does not apply to any Product the exterior of which has been damaged or defected, which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design, construction or interfacing. Tampering With Label Voids Warranty.

In order to enforce the rights under this limited warranty, the purchaser should mail, ship, or carry the Product, together with proof of purchase, to ACTiSYS .

The limited warranty described above is in addition to whatever implied warranties may be granted to purchasers by law. To the extent permitted by applicable law, ALL IMPLIED WARRANTIES INCLUDING THE WARRANTIES OF MERCHANT ABILITY AND FITNESS FOR USE ARE LIMITED TO A PERIOD OF 1 YEAR FROM THE DATE OF PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties beyond the time period described above on behalf of ACTiSYS Corporation.

The warranties described above shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described above, shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall ACTiSYS Corporation be liable or in any way responsible, for any damages or defects in the Product which were caused by repairs or attempted repairs performed by anyone other than ACTiSYS technician. Nor shall ACTiSYS Corporation be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

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